The Mining Journal

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Vol. CCXXXIX No. 6105 — LONDON, AUGUST 22, 1952 — PRICE 8d

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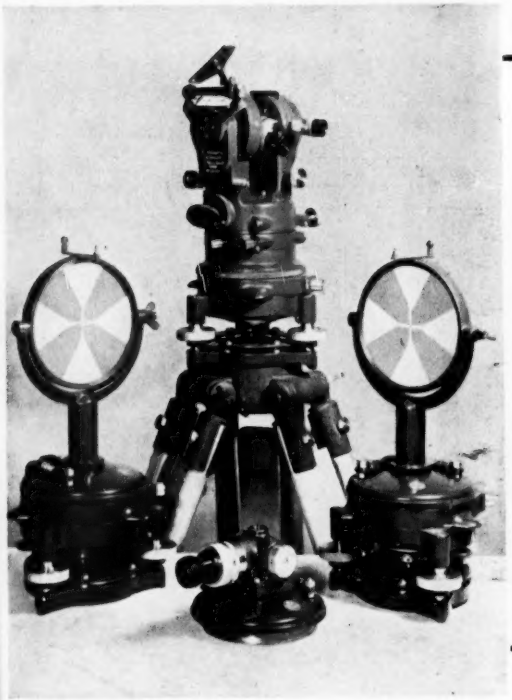

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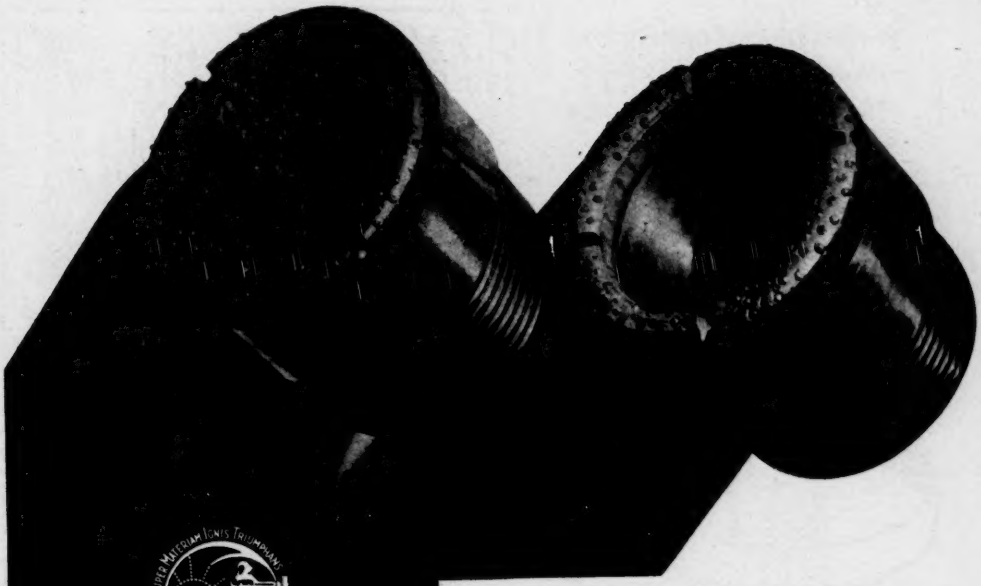

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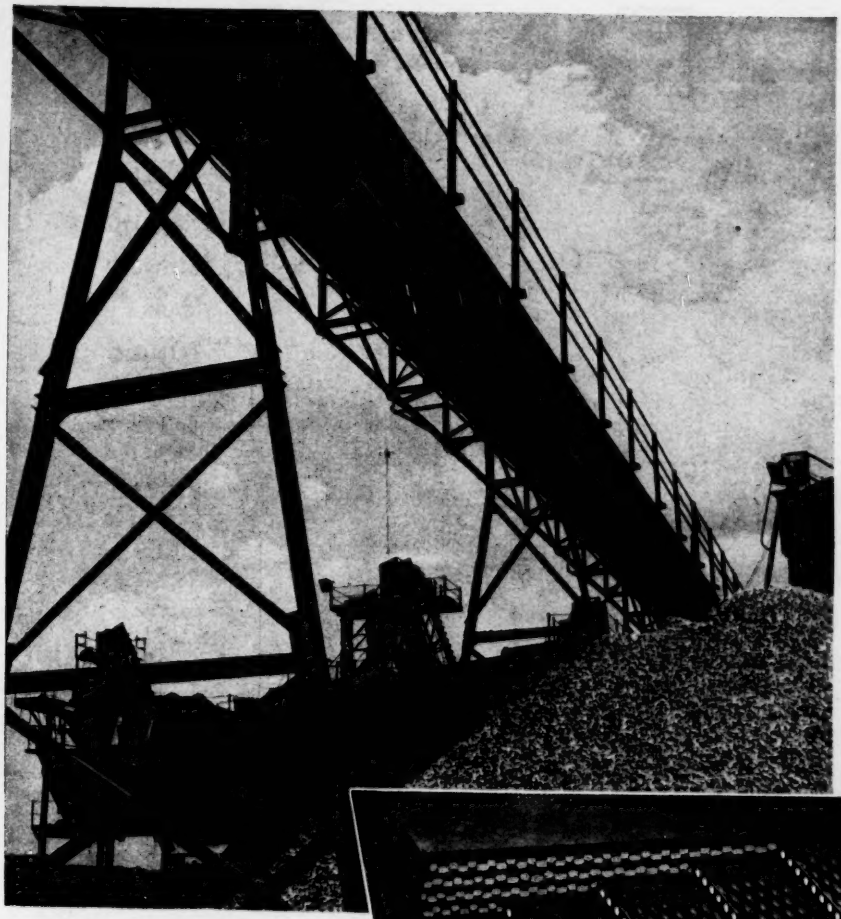

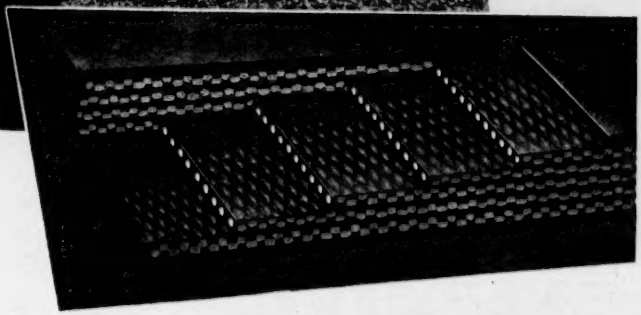

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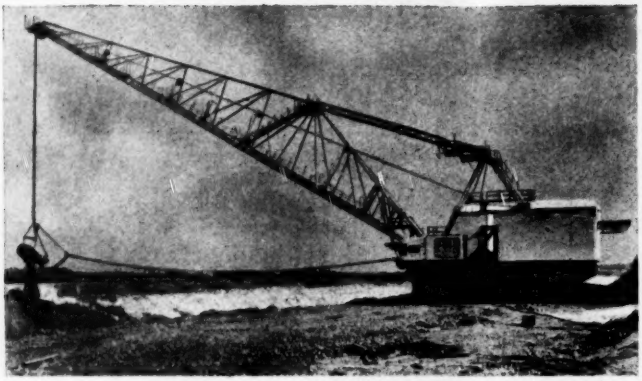

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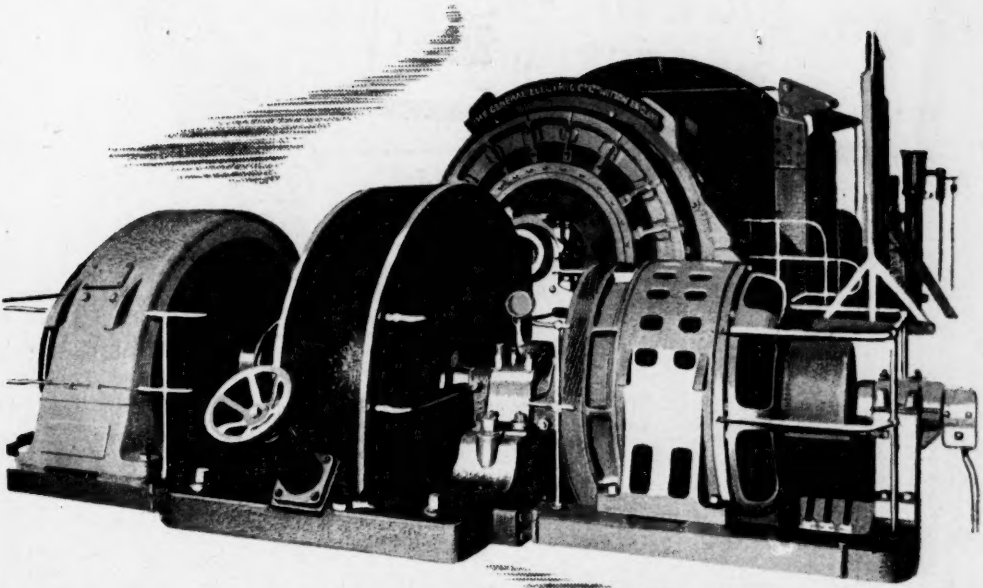

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Established 1835

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NOTES AND COMMENTS

Copper and the Paley Report

Broadly speaking, the tenor of the Paley report in regard to copper (summarized on page 199) is more or less in harmony with the impressions which prevail here and in other countries where an extensive interest in copper supply exists. This, however, may be partly due to the fact that American conceptions have largely prevailed through the influence of great copper enterprises closely integrated with the United States' major concerns.

Possibly the most striking aspect of the Report is its ready acquiescence in the assumption that the United States' copper mining has passed its zenith. Anaconda and other important producers have recently protested against government advice to consumers to be on the lookout for substitutes for copper wherever possible: it will be interesting, therefore, to see what attitude they adopt towards a general conclusion of growing United States deficiency. The estimate that over the next 25 years United States' copper consumption, even allowing for increased imports, should increase by 43 per cent, and in other free countries by 54 per cent as compared with an increase of 291 per cent and 415 per cent in the case of aluminium is a striking commentary on the shape of things to come, and possibly helps to explain the somewhat complacent view as to probable adequacy of supply.

It will not escape notice that the importance of developing geological techniques as yet unknown is emphasized or that current geological opinion is on the whole sceptical of major new discoveries. The increasing reliance on foreign fields for supplies perhaps hardly takes full account of the tendency in some countries to profit by the U.S. deficiency and endeavour to drive a hard bargain, possibly imposing export duties to assist a precarious national economy. Most countries must take account of national sentiment, the appetite of labour unions and the desire to conserve natural resources. Then again copper mining, unlike tin, is exclusively confined to lode mining and therefore calls for highly trained mine labour always liable to be dissipated by strikes or internal disorders and already in short supply.

The availability of "Risk" capital is not discussed, and though the U.S. Government may continue to be prodigal of expenditure on large projects of mineral research and development and improvement of communications we cannot see it undertaking to mine foreign deposits on its own account.

The North of England Institute of Mining and Mechanical Engineers—A Century of Progress

The year 1952 heralds the centenary of the North of England Institute of Mining and Mechanical Engineers, a body which has been of incalculable service to the coal mining industry and which embraces a world-wide membership.

In celebration of the event, the Institute has published a centenary brochure outlining its growth and endeavours, which has been received in this office with particular interest. For our files reveal that a few weeks over a century ago in the July 10, 1852, issue of *The Mining Journal*, notice was given of the formation of a society "to meet at fixed periods, and discuss the means for the ventilation of coal mines, for the prevention of accidents, and for general purposes connected with the winning and working of collieries." This meeting was held in the Coal Trade Office, Newcastle-on-Tyne, on Saturday, July 3, 1852, and was attended by colliery owners, miners and others interested in the coal trade, who agreed that the society should be named "The North of England Society for the Prevention of Accidents and for other purposes connected with mining." Later, in 1866, the Society joined "to itself gentlemen of scientific and manufacturing skill" and became known by its present title.

Since those days of inauguration the Institute has carried out duties in varied spheres of mining work, and from our own point of view it is particularly pleasing that editorial comment in *The Mining Journal* of the date mentioned welcomed the new society unreservedly as "having for its objects the diffusion of useful information among the colliery population, the discussion of topics immediately connected with ventilation, and the general

scientific details of the winning and working of collieries, and thus pioneer the way to the universal adoption of measures by which the occurrence of such a multiplicity of fatal and distressing catastrophes as we have hitherto been compelled to witness may be prevented. The object is a highly philanthropic one, and it is very gratifying to find that the objects of the proposed society were heartily supported by a large number of principal coalowners and viewers of the district . . . We cannot close these few remarks without congratulating the working collier on the sympathy which appears now to be awakened in his behalf . . ."

In the early days of its existence the Institute paid particular attention to the lamentable lack of ventilation in British pits, at a time when Governmental interest was slowly being stirred to action on this subject. The possibilities of some type of coal cutting machine were investigated, and the generally accepted standard of safety of the Davy lamp was suspect, by committees appointed by the Institute.

During the latter months of 1852 controversy appeared in the pages of *The Mining Journal*, wherein letters to the editor on the pros and cons of the suitability of the Institute and on possible improvements in ventilation systems found many able champions. One of them was David Mushet, who wrote with wit and at length on aspects of ventilation.

A summary of the general opinion, however, came in our issue of August 28, 1852, when a contributor who signed himself "A Looker-On," stressed the key sentence of the Parliamentary Committee's report on ventilation which stated: "Some such central body your committee would strongly recommend, composed of scientific and practical men . . ." Editorial comment was not slow in following, and on October 30, *The Mining Journal* hailed what now appeared to the editor as "the firm establishment" of the Institute.

Since these days the North of England Institute of Mining and Mechanical Engineers, granted Royal Charter in 1876, has become a body renowned internationally among mining men. It is perhaps fitting that a new generation of the staff of *The Mining Journal* should record the activities of a new generation of Institute members in an endeavour that has not changed with the passing of the years.

Norwegian Mineral Resources

A five-year plan aimed at the mapping out of the untapped resources of ores and minerals believed to exist in the rocks and mountains of northern Norway, has been arranged to begin this summer. The plan will concentrate on investigating the nature and extent of the sources of those minerals which can play a part in the planned industrial expansion of northern Norway. These minerals include zinc, lead, graphite, magnesium-pyrites, copper pyrites, and an ore named nefelin-albitt. This latter ore is now being used increasingly in the glass and porcelain industry in the United States. The Geological Investigation Institute of Norway will be in charge of the five-year plan.

The work this summer, regarded of reconnaissance value, is aimed mainly at four specific district targets. The first, at Susendalen in Hattfjelldal, is an area wherein zinc and lead sources are known to exist, and are believed also to contain precious metals. The second district, at Rendalsvik in Holandsfjord, contains graphite which may be worthwhile for use as the basis of an industrial enterprise. The other two areas are the island of Seiland in Finnmark, where the rocks have shown traces of nefelin-albitt, and the so-called ore province between Kvenangen and Lyngen, where magnesium pyrites and copper pyrites are to be found. It was hoped that under the plan experimental production would begin at Vaddas in the northern end of the area.

In its entirety, the programme is intended to cover all parts of the country, but the extent to which this will be carried out will depend upon the results achieved this summer in the north Norway area.

Portugal

(From Our Own Correspondent)

Oporto, Aug. 11

Speaking generally, the first half of this year failed to produce anything beyond that which the writing on the wall had been for so long making clear to anyone with eyes to see. The inevitable result of the penal export duties levied on wolfram and tin ores materialized in the form of a wide spread net of smuggling activities for passing ores into Spain. Considering that the margin of profit between the Portuguese and the Spanish f.o.b. quotation is 10s. per kilo the risk seems well worth running. Some of the numerous back-sliders have been caught and the regular shippers wish the Authorities every success in their efforts to check these illegal activities as it is impossible for the legal exporter to compete with those buyers who buy here for smuggling into Spain.

The successive falls in the price of wolfram ores caused surprise to no one except the opportunists infesting this market, who then turned their attention to tin ore; which, however, lends itself less to questionable activities than does wolfram.

MINERAL EXPORTS FOR SIX MONTHS, 1952

	May 1952 (*Tonnes*)	*June* 1952 (*Tonnes*)	*Jan./June* 1952 (*Tonnes*)	*Jan./Dec.* 1951 (*Tonnes*)
Wolfram concentrates	568	481	2,393	4,223
Tin concentrates	266	155	791	1,025
White arsenic	137	Nil	544	807
Cupreous pyrites	61,579	26,110	181,399	570,939
Roasted and leached pyrites	31,325	33,480	146,475	Nil
Manganese oxide	130	250	1,987	10,536
Iron ore (estimated)...	2,000	2,000	12,000	10,000

England is now well behind the U.S.A. as a buyer of Portuguese ores. Export licences to U.K. are not easy to obtain, whereas permits are freely given to U.S.A. Possibly when European Payments Union ceases to rule the waves U.K. will be given an opportunity to regain her lost position.

Your correspondent had drawn up a few notes on the export of iron ore from the Moncorvo Mines, but the article published in *The Mining Journal* of July 25, 1952, deals so fully with the matter that little remains to be said. This ore was sent to London in 1946 for examination, the general opinion being that the silica content was too high and the transport expenses too heavy to make those mines a commercial proposition. Transport is primitive, inasmuch as the ore is brought from the mines to a metre track railway, carried some 30 miles to the wide track railway, thence to the dock-side and from the dock-side on board the freighter. It has also been reported here that suitable machinery will be installed to speed up production and reduce charges. The estimate of the possible reserves is probably correct, as Snr. Neiva Cotelo is a most competent and clever mining engineer.

COLONIAL MINERALS DEVELOPMENT—XV

Sierra Leone

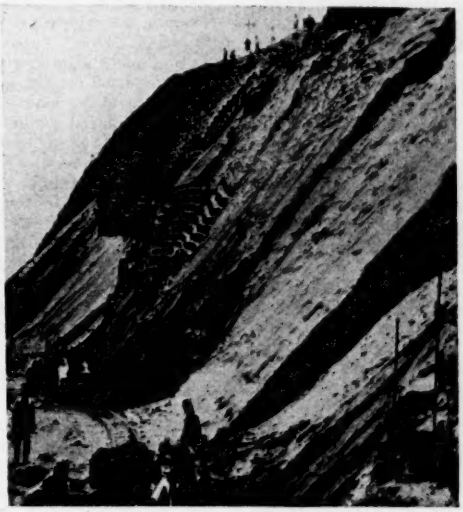
By A. G. THOMSON

In the following article, the fifteenth in the series devoted to the mineral development of British territories overseas, the author points out the difficulties of geological surveying in Sierra Leone and adds that iron ore and diamonds are the principal mineral products.

Sierra Leone is situated on the West Coast of Africa between French Guinea and Liberia. It has an area of 27,669 sq. miles and a population of approximately 1,700,000. Most of this territory is covered with dense forests or bush and vast areas are overlain by residual laterite or detritus, so that geological surveying is difficult and arduous. Geologists are also hampered by the high rainfall, which averages about 150 in. per annum in Freetown and decreases further inland to about 80 in. in the north of the country. Most of the rain falls between July and September.

Little was known of the geology of Sierra Leone when the first Geological Survey was formed in 1918 under Dr. F. Dixey (now Director of the Colonial Geological Surveys and Geological Adviser to the Secretary of State for the Colonies). No mineral deposits of immediate economic value were discovered and in 1921 the Survey was discontinued for financial reasons after the first geological map of the Colony had been made.

Four years later the late Sir Albert Kitson, then Director of the Gold Coast Geological Survey, advised the Government of Sierra Leone that the geology as revealed by the work of Dixey seemed favourable for the formation of mineral deposits and would justify further examination. Dr. N. R. Junner was therefore seconded from the Gold Coast early in 1926 and within a few months some important discoveries had been made. These included high-grade haematite ore deposits near Marampa, alluvial platinum in several streams, and alluvial gold in various streams and rivers. The interest of prospectors and mining companies was soon attracted and in 1928 a combined Geological and Mines Department was established with Junner as its first director. Further important discoveries followed; among the minerals found being chromite, ilmenite and alluvial diamonds, as well as very large deposits of haematite iron near the Tonkolili River (described by Mrs. Fowler-Lunn in *Economic Geology*, Vol. 28, 1, p. 33), and numerous occurrences of alluvial gold.



(Courtesy of Central Office of Information)

Terraces of grey powder iron ore at Marampa mine

DEPOSITS OF IRON ORE AND DIAMONDS

Mining began in 1929 when 26 oz. of platinum worth £252 were produced. So rapid was the expansion of the industry that in 1939 the output of minerals amounted in value to £1,744,576. Up to the end of 1949 the total value of all minerals produced in Sierra Leone was £24,600,000.

Several large deposits of iron ore are known, but only those discovered by Junner in the Marampa chiefdom have been worked. In 1930, the Sierra Leone Development Co. Ltd. obtained mining rights over the Marampa deposits and started to develop them. An up-to-date loading plant was installed and 52 miles of railway were constructed to link the mine to the port. The contructional work was completed in 1937 and production was rapidly expanded, a peak of 1,029,970 tons being achieved in 1941. In 1950 and 1951 shipments to the United Kingdom amounted respectively to 732,200 and 626,600 tons. Preparations are being made to work the Tonkolili deposits, which are even more extensive than those of Marampa, and the railway route has already been surveyed.

Diamonds were first discovered by the Geological Survey in 1930, when two gemstones were recovered from terrace gravel of a stream in the Kuno district. The early strikes were followed up by the Consolidated African Selection Trust Ltd., and after four years of intensive prospecting this company was able to confirm the existence of a major diamond field. After lengthy negotiations the sole right to prospect for or mine diamonds in Sierra Leone (except in the Marampa and Tonkolili iron ore concessions) for a period of 99 years was granted by the Government to a subsidiary known as Sierra Leone Selection Trust Ltd., in return for participation in the profits arising from mining operations of Sierra Leone to the extent of 27½ per cent of the annual net profit and an annual mineral rental of £7,000.

Mining is at present confined to a small area in the vicinity of Sefadu and Yengema. The diamond industry employs the largest labour force in the Colony and the major deposits have been equipped with electrically operated pan concentrating plants. Production during the war amounted to nearly 4,750,000 carats, the peak year being 1942 when 1,046,187 ct. were produced. During the first nine months of last year there was an output of 359,853 ct. The total production of diamonds in Sierra Leone from their discovery 22 years ago to the end of 1951 has amounted to approximately 11,000,000 ct., about 34 per cent of the diamonds being of gem quality and the balance industrial stones.

Gold has been mined since 1930 and by the end of 1949, 326,603 troy oz. had been produced. The peak year was 1936, when 40,764 oz. were exported. During the war years there was a steep and progressive fall in production, due partly to the advent of Lend Lease in 1941 and partly

to exhaustion of the known rich and shallow deposits. In 1946 output fell to under 200 oz., but a slight revival of interest has since taken place. Mining has been carried out mainly by hand methods from comparatively shallow deposits, but dragline excavators have been used in some of the larger deposits. In 1939, a Ruston-Bucyrus dredge with 4½ cu. ft. buckets was installed on the Pampana River, but it had to close down in 1942 owing to lack of spare parts. Operations were restarted in 1947 with satisfactory results. On January 1, 1948, a system was introduced under which small-scale mining by individual Africans was allowed. This licensing scheme reserves the pickings of the remaining rich and shallow deposits for Africans, but for the deeper deposits of lower grade mechanical methods will be required.

Since 1929 there has been a small production of alluvial platinum, all mining being done by hand. To the end of 1949 a total of 5,242 oz. of platinum had been produced. The stream deposits are usually rich but small and are characterized by a high proportion of nuggets to dust. The source of the platinum has not yet been discovered, but the Geological Survey recently traced alluvial formerly mined near Guma Water and York to disseminations of the metal in: (1) a mafic olivine gabbro with pegmatitic facies at Guma Water; (2) seams of titaniferous magnetite less than 9 in. wide in the anorthositic gabbro; and (3) coarse and medium grained anorthosite near York. In all these rocks and minerals the platinum is too dispersed to be workable. From a sample of eluvial platinum submitted to the Directorate of Colonial Geological Surveys, a mineral has been isolated that is probably new. It crystallizes in pyritohedra and appears to consist of iridium, osmium, a trace of ruthenium, and possibly some sulphur.

Chromite is mined by the Sierra Leone Chrome Mines Ltd., which holds an exclusive prospecting licence over an area of 1,893 sq. miles, in which most of the known deposits of this mineral are located. At present mining operations are confined to deposits in the Kambui Hills near N'gerihun, partly because of the accessibility and partly because these deposits appear to be larger and richer in Cr_2O_3 content than the other known occurrences. The output is transported by lorry to Hangha and thence by rail to Cline Town near Freetown, the distance from mine to port being about 180 miles. To the end of 1949 the total production of chrome was 136,018 tons. During the first nine months of last year there was an output of 11,119 tons, which compares with 7,399 tons for the whole of 1950. The chromic oxide content of the ore is low, averaging between 43 and 44 per cent Cr_2O_3, but the chrome ratio is favourable. Preliminary experiments have shown that by suitable beneficiation the chromic oxide content could be improved to 50 per cent without affecting the iron-chrome ratio. The deposits have been prospected by diamond drilling and have been proved to a depth of at least 200 ft. Mining by opencast is apparently reaching the stage where it ceases to be economical and underground methods are therefore being introduced.

POTENTIAL MINERAL RESOURCES

Junner drew attention to the possible economic value of ilmenite occurrences and of alluvial concentrations of ilmenite in the beach sands between Tokeh and York and in the Whale River estuary. Both the beach sands and the massive deposits have been examined by mining concerns and it has been concluded that they contain satisfactory material for use in the manufacture of the pigment titanium white. A British company prospected deposits of massive ilmenite and titaniferous magnetite near Grafton and Hastings. Its work showed that much of the ore is coarsely crystalline and granular and that the ilmenite and magnetite exist as separate crystalline identities, which could be parted magnetically to yield on the one hand ilmenite containing at least 48 per cent TiO_2 and on the other magnetite low in titanium content.

Among other known minerals of potential interest are bauxite, cassiterite, corundum, columbite and tantalite, ilmenorutile, molybdenum, rutile, lignite and brick clays.

It has been stated [1] that the combined expenditure of the Geological and Mines Department has been covered forty times over by the Government's annual revenue from profits tax and royalties. For many years the Geological Survey was handicapped by the absence of laboratory facilities, but in 1950 a new headquarters building was completed and equipped with chemical and assay laboratories, which are now in full operation.

METHODS AND RESULTS OF SURVEYING

One of the first tasks to be undertaken by the expanded Survey was the systematic mapping of the schist areas, which is being followed by detailed examination for possible further deposits of economic minerals. Already 6½ sq. miles of the Gabbroid Colony complex have been mapped, the main effort being in the Kangari Schist Belt, Tonkolili district. An attempt is being made with the help of aerial maps to elucidate the structure of this area in some detail, and it is hoped that the resulting maps may assist in the location of the mineralized areas from which the alluvial gold found in so many streams has been shed. Prospecting in the Kangari Schist Belt has revealed an auriferous vein, which contains pyrites, arsenical pyrites, small quantities of zinc blende and traces of lead. The occurrence has been cleared, trenched and topographically surveyed, and systematic samples have been taken from the vein. A few picked specimens of ore contain from 4 to 27 oz. of bullion per ton, but the average gold value is certain to be far less.

In the Progress Report for 1951 [2] reference is made to unworn pieces of quartz-float with traces of galena, and of aplite- and magmatite-float containing substantial amounts of molybdenite, which were among the spoil from pits dug by alluvial workers in the bed of the Dali River at Dalakuru. These pits extend for about a mile and a half along the river, which may occupy a zone of weakness that favoured the emplacement of intrusions.

About 1926 the Geological Survey recorded from the Kenema Schist Belt a veinlet that carried galena and zinc blende. Since lead and zinc minerals have also been reported from Liberia, the metallogenic province to which they belong is evidently extensive, and if there is anywhere in the schist belts a suitable structural and petrologic setting, a sizable basemetal ore body might be discovered.

Lignite prospecting has revealed beds near Masanki, Moyambi District, and at Granville Brook, Cline Town. A 25-ton sample of lignite submitted by the Geological Survey was tested by Sierra Leone railways with quite satisfactory results.

In 1950, a visit to the chromite quarries of Sierra Leone Chromite Mines in the Kenema Schist Belt disclosed the presence of vermiculite selvages to the granitic pegmatite dykes that intrude the serpentized ultrabasic country rocks of the ore bodies. Though the amount of vermiculite is too small to be worth exploiting, there might be workable deposits in similar environments elsewhere in the schist belt.

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2. Progress Report on the Colonial Geological Surveys, 1951, by F. Dixey, C.M.G., O.B.E., D.Sc., F.G.S., M.I.M.M. *Colonial Geology & Mineral Resources, Vol. 2, No. 3.*

THE PALEY REPORT—II

Copper Will Remain Tight

This is the second of our summaries of Free World metal requirements in the next quarter century taken from the Paley Report. Our comment is on page 195. Last week's issue dealt with Tin.

In copper, where the authors of the Paley report are on more familiar ground and able to speak with more definiteness, big changes in the conventional picture are seen. Though an overall increase in use is projected by 1975 domestic production on balance is expected to decline.

The following table analyses the various sources of consumption in the United States and blue prints what this may become by 1975:

U.S. Copper Demand—Current and Projected

End Use	1950 (000's	1975 *s. tons.)*	*Projected Increase* %
Electrical equipment	303	485	60
Telephone and telegraph	87	87	Nil
Light and power	100	150	50
Appliances	106	159	50
Ammunition	70	105	50
Automobiles	145	193	33
Building	135	175	30
Railroads	25	50	100
Ships	22	22	Nil
Other uses of new copper	227	340	50
Other uses of old scrap	360	450	25
Allowance for Cu content of exports	150	284	89
Total U.S. demand for copper	1,730	2,500	45
Less scrap	—475	—700	33
Total U.S. demand for NEW copper	1,255	1,800	43

It will be seen from this table that the U.S. consumption of virgin copper is expected to increase from 1,255,000 s.tons in 1950 to 1,800,000 s.tons in 1975. To this requirement the report adds projected consumption in the rest of the free world as shown in the next table.

Projected Primary Copper Consumption in the Free World

	1950 (000's	1975 *s. tons)*	*Percentage Increase*
United States	1,255	1,800	43
Canada	100	152	52
United Kingdom	374	490	31
Free Europe	627	909	45
Australia and New Zealand	45	81	79
Japan	42	88	110
Others	155	345	123
Total	2,598	3,865	49

These figures indicate a total projected increase of 49 per cent over the 1950 consumption of 2,598,000 s.tons.

The change from the position of the United States as an exporter on balance to that of an importer began to appear about 1936 and has grown progressively since, and this tendency will grow as copper becomes scarcer and dearer, and substitution of many competing materials is likely to play an increased part in the outlook for the metal. Allied to substitution is increasing availability of scrap of which by 1975 the estimate is 700,000 s.tons as compared with say 800,000 s.tons of new copper from domestic sources.

Under the stimulation of the second world war, domestic production reached 1,091,000 s.tons in 1943 but in 1950 it had dropped to 900,700 tons. Production from scrap in 1950 was 475,000 s.tons and net imports 448,000. The actual consumption was less than the sum of these figures, totalling 1,700,000 tons.

With U.S. production tending to decline the full projected increase in free world consumption will have to be met from outside the States. This fact is brought out in the chart on the next page which emphasizes that production in other free countries will need to double over the next twenty-five years from 1,600,000 s.tons up to a little over 3,000,000 s.tons.

ORE RESERVES

The "measured," "indicated" and "inferred" reserves in the U.S. in 1950 were estimated at around 25,000,000 s.tons of recoverable copper. The weight of technical opinion suggests that these reserves plus future extensions and discoveries can not do better than maintain an annual capacity of 800,000 s.tons through the quarter of a century, and more ore reserves will have to be found if the present 25,000,000 tons is to be maintained.

Practically all the known occurrences of copper mineralization were explored during the second world war and those found to be of commercial grade have been or are being prepared for production but this additional supply will soon be offset by depletion elsewhere while the prevailing view among geologists is that, with the present techniques and knowledge, the chances of further discoveries outside the known districts is small. It is unlikely that a lowering of the grade is at present foreseeable as this would entail a drop in recovery to an uneconomic level with current prices, and little copper remains in the ore below the current cut-off grade of say 0.5 per cent. Thus any significant increase in output capacity must depend on entirely fresh discoveries of whole new districts dependent on the development of geological techniques yet unknown.

Outside the U.S. reserves are ample to support the productive capacity necessary (see table below). Reserves in 1950 of "measured," "indicated" and "inferred" ore are estimated at 190,000,000 tons of copper as a minimum—more than a hundred times the 1950 production and more than sixty times the "required" 1975 level. The critical position in copper throughout the free world in the past two years was largely due to the lag in output expansion.

Free World Copper Reserves

	s. tons of contained metal	*Grade of ore* (% Cu)
Chile	75,000,000	1.6
†Northern Rhodesia	68,000,000	3.2
Belgian Congo	40,000,000	4.5
United States	25,000,000	1.0
*Canada	7,125,000	1.6
Minimum total	±200,000	

*Including 1,275,000 s.tons ore averaging 1.1% Cu in submarginal and inactive mines.

†Including 50,000,000 s.tons "inferred" ore averaging 3% Cu.

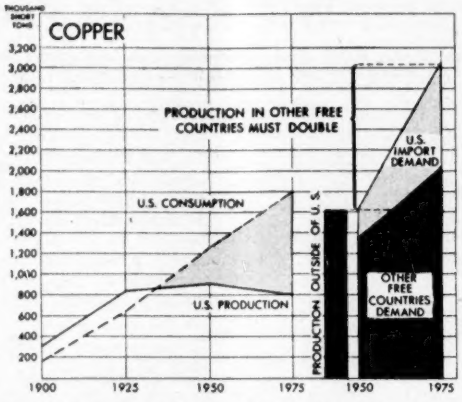
In Chile reserves are estimated at 75,000,000 s.tons copper. In Northern Rhodesia the Nachanga reserves are placed at 5,800,000 tons, at Mufulira 5,340,000 tons

and at Rhokana 3,140,000 tons. In the Belgian Congo reserves including undeveloped deposits are estimated at from 40,000,000 to 85,000,000 tons. In Peru, undeveloped deposits in the extreme south of the republic, where preliminary work is being undertaken, a production potential possibly equal to that of Chile is predicted.

Speaking broadly, it is regarded as likely that a number of the important U.S. producers will prefer to continue to expand operations abroad rather than mine low grade deposits at home. If sufficient expansion in output is achieved the cost of copper in terms of U.S. dollars at 1950 values should remain in the neighbourhood of the 1950 price range, which is well above the long run cost of production of major producers throughout the world. While to meet the need of increase in production, prices should remain sufficiently above general cost levels to make the expansion a profitable proposition.

Should a greater shortage of copper with a consequent rise in price develop, substitution to an increasing degree will take place. A widespread substitution of aluminium for copper is practicable; copper since the war has been consistently more expensive than aluminium which has almost completely displaced it in high-tension power transmission and is rapidly doing so in urban power distribution, and tending to supplant it in the windings of fractional horsepower motors and large generators. Cast iron may be substituted as a backing for babbitt metal in place of bronze in railroad bearings, and alloy steels and plastics in a variety of uses. However, the electrical industries, and end-products requiring copper are expected to ensure the demand will exceed supply over the next twenty-five years.

In view of the change in the U.S. position which makes it a great copper importing country with the prospects of still further large increase the authors of the Report are led to the conclusion that there is little justification for an import tariff on copper in the future.



The Paley Report shows in this Table that the Free World rate of production of primary copper outside of the U.S.A. will need to double itself in the next 25 years to keep pace with an anticipated 49 per cent increase in total demand for new metal. This expectation presupposes a decline in U.S. domestic mine production which is not expected to exceed 800,000 s.tons by 1975

The Importance of Correctly Loading Conveyor Belts

By E. SIMPSON, Manager, Goodyear Technical Service, South Africa.

Conveyor belt systems are assuming an ever-increasing importance in mines of all types, and in the following article the author, who is manager of the Goodyear Technical Service in South Africa, points out that correct loading is a key factor in their maintenance.

It is not correct to assume that due to the nature of the loads carried and the large lump size, that short life must be expected of conveyor belts. It is also a fallacy to assume that the equipment and belts in South Africa are of lower standard than those used in other countries. In general, heavy duty equipment of good quality is available, and the lowest quality of belt specified and built in South Africa conforms with the highest specification issued by the British Bureau of Standards for Grade A Conveyor Belts. Grades B, C and D of a lesser standard are made and specified for installation in many other countries.

Goodyear manufacture their standard type A conveyor belt, their well-known Stacker conveyor belt, Ore-Flo, Coal-Flo and Rayon Fabric belts in South Africa. These belts are all definitely premium quality belts built to specifications which are higher than the British Standard Specification for Grade A conveyor belts above mentioned.

In addition to the initial cost of conveyor belts, belt costs recur as replacements become necessary. It is estimated that 80 per cent of the failure of conveyor belts is due to impact, wear and abrasion and 90 per cent of the accidental damage all occurs at the loading point of the conveyor. It is thus very evident how important it is to design the loading equipment employed.

Introducing the load to conveyor belts must be studied and designed with two major points in view. Firstly, the flow of material must be controlled, secondly the material must be loaded with a minimum impact so as to reduce bruising and fractures of the carcass, and abrasion and wear of the cover to a minimum.

The flow of material should be regulated and controlled to maintain an even consistent load within the specified capacity of the belt at the belt speed, for relative weights of material per cubic feet.

VALUE OF LOAD CONTROL

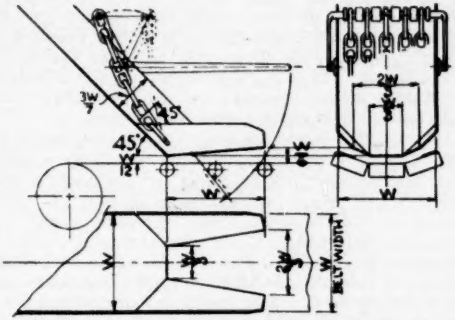
To assume that the output of a mine per day, divided by the working hours, gives anything more than the average load the belt will have to carry, is incorrect. In practice it is found that unless the load is positively controlled, the conveyor belts are often found to be severely over-loaded, which not only causes spillage and increases the hazards of damage to the belt, but results in severely over-stressing the tensions for which the belt has been designed.

Momentary tensions developed, which are higher than permissible tensions specified, caused by irregular flow of material and bad loading, will result in diminishing the life of the belt by years in the short space of minutes.

Although it would be ideal to introduce the load to a belt on a horizontal section at the loading end in the same direction as the belt travels and at the same speed as the belt, unfortunately conditions of operation very seldom make these ideal conditions possible. It is, however, found

in many cases that lack of consideration of these points result in bad loading conditions having to be endured for many years.

Feeders of approved design with a positive control of the tons per hour delivered, are thus most essential. The



Variable suspension chains regulate conveyor feed in the Langlaagte Chute

cost of well designed feeders can always be well justified. Wide, short conveyor belt feeders designed to run at a speed to control the specified load can be employed to advantage to introduce the load to a series of conveyor belts employed in any plant. This type of feeder belt provides a means of solving many of the difficulties in receiving a load from ore bins and feeding it to relatively long centre narrow conveyor belts designed to run at relatively high belt speeds.

Once the flow of material is controlled the problem of correctly introducing and positioning the load on the belt is greatly simplified. The design of a chute to handle a load of consistent nature and of uniform size is relatively simple. Difficulties are experienced in handling run of mine ore of large lump size, particularly when narrow belts are employed. Under these severe conditions, consideration must be given in designing both loading conditions and the belt, to the percentage of fines in the load and the angle of repose of material, and also the degree of impact that must be handled.

THE LANGLAAGTE CHUTE

The drawing shown of a modified design of what is known in South Africa as the Langlaagte Chute, will serve as a basic design of a chute that will give the most satisfactory loading conditions. The drag chains shown, suspended from a yoke that can be manually adjusted, provide a simple, cheap and effective means of controlling the flow of material that may vary in consistency. The dimensions shown are relative to the belt width. The angles should be determined by the angle of repose of material in its worst state—wet and sticky.

An important feature of this design of chute is that the use of skirting can in most cases be eliminated. It will be noted that the side plates are splayed and provide a relief in the clearance between the chute and the belt. This relief of clearance is important, as it enables material trapped between the chute and belt to clear itself without undue abrasion and wear on the covers of the belt. The reduced opening at the heel of the chute introduces the fines in the load to the belt before the large lump size and establishes a cushion of material on the belt to resist impact and abrasion.

A modified design of this type of chute folds up to permit of loading from a series of ore passers from a bin. These chutes have given outstanding results at a well-known gold mine, and have resulted in belt life being more than doubled.

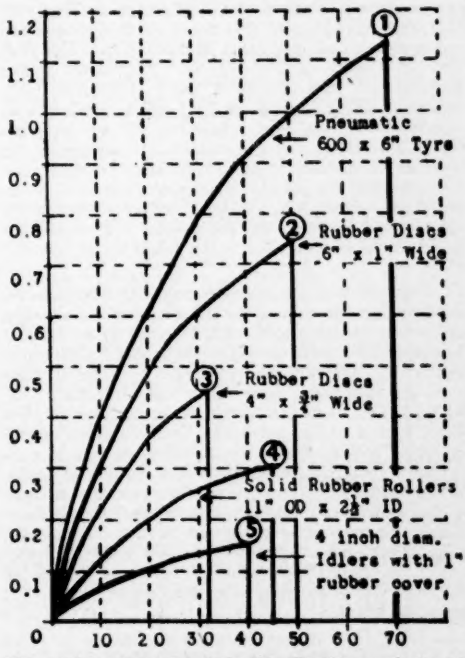
The effect of heavy impact on belt life can be considerably reduced by employing impact idlers of improved type and design as shown in the accompanying photographs. The efficiency of impact idlers depends on the shock absorbing qualities of the rubber coverings, to the idlers. The accompanying graph illustrates the relative value of various types of impact idlers in common use.

Referring to the graph: 1 indicates the relative impact load absorbed by pneumatic 6.00 x 6 tyred idlers; 2, Impact idlers built up of 6 in. by 1 in. rubber discs; 3, Rubber discs 4 in. x ¾ in.; 4, solid rubber rollers 11 in. outside diameter by 2½ in., inside diameter; 5, 4 in. diameter metal idlers with 1 in. rubber covering.

Of the heavy duty impact idlers recommended by Goodyear, that using pneumatic tyres gives most satisfactory results in reducing the effect of severe impact duty of large lump size particularly if the load is devoid of fines.

The effect of severe loading conditions on belt life has led to the necessity of incorporating a special breaker ply of lino weave fabric impregnated with cushion gum, in the specification of belts which have to handle severe loading conditions. This breaker fabric firstly reinforces the cover, secondly increases the adhesion of cover to carcass, and thirdly provides added cushioning effect to the belt construction. Fourthly, it serves as an added seal between the cover and carcass to prevent water and moisture being absorbed when cuts and breaks develop in the rubber covers.

Relative Cushioning of Impact Idlers



Figures above, impact load in lbs. The figures on the left indicate distortion of diameter in inches

All belts manufactured by Goodyear in their Uitenhage Plant can be supplied with this breaker reinforcement added to the specification. The additional cost more than

justifies this addition when conveyor belts are subjected to heavy duty conditions.

The cotton and rayon carcasses of all Goodyear conveyor belts is mildew inhibited. Goodyear's exclusive and time proven mildew inhibitor need not be specified as it is included in our standard production. Goodyear's leadership in the conquest of mildew is backed up by more than 25 years of proven field service and documented evidence of its effectiveness.

Goodyear Stacker, Ore-Flo and Coal-Flo conveyor belts have been specifically designed to extend belt life under severe operating conditions as exist in the coal and gold mines of South Africa.

Goodyear Stacker, Ore-Flo, Coal-Flo and Rayon Carcass conveyor belts have also a skim coat of additional rubber built into the carcass between each ply. This added inter-ply of rubber increases the flexibility 250 per cent to 300 per cent and gives further added cushioning effect to the carcass of the belt.

The above indicates very forcibly the importance which Goodyear attributes to the research work they have done in the past, and their continued interest in improving the design of equipment and specifications of the belts they build.

The Coal Industry

(From Our Coal Correspondent)

In the course of the debate on the report of the National Coal Board in the House of Lords on July 30, Lord Leathers, Minister of Co-ordination of Transport, Fuel and Power, stated that the output of deep-mined and open-cast coal may reach 226,000,000 tons this year. This is slightly more than the 229,400,000 tonnes quoted in our issue of July 25 and it is therefore likely that the O.E.E.C. forecast for 1952 will be substantiated, provided, of course, that production will not be interrupted during the next few months on account of the rejection of the miners' claim for increased wages. It is estimated that the concession of this claim for an all-round increase of 30s. a week would cost the industry £50,000,000 a year and that the price of coal to the consumer would thereby have to be raised by at least 5s. a ton.

Coal stocks have already reached the 17,000,000 tons required for the winter and if the present rate of accumulation continues a reserve of 22,000,000 tons will be available at the end of the summer period on November 1. This would provide the minimum buffer margin of 5,000,000 tons above the operational needs which was advocated by the National Coal Board's economic adviser at their summer school held at Oxford last month, as an insurance against any likely fuel crisis and also to allow the rate of production to be reduced temporarily at some pits for repairs and reconstruction. On this issue, however, the Minister of Fuel and Power will have to take heed of the Chancellor's demand for a further rise in the export target from 12,500,000 to 15,500,000 tons as a major contribution to the Government's effort to bring the balance of payments with non-sterling areas into equilibrium by the end of the year.

WESTERN EUROPEAN PRODUCTION AND CONSUMPTION REVIEWED

The Ministerial Coal Production Group of O.E.E.C., consisting of Dr. Stikker (Netherlands), Chairman, Lord Leathers (Great Britain), M. Louvel (France) and Dr. Westrick (Germany) met in London on July 28 to review the production and consumption figures for the immediate future and to discuss the financing of investments in the coal industries on the Continent. The general conclusion reached at this meeting was that, although the trend of production during the first half of this year does not make it certain that the targets set for all the countries of Western Europe, as shown in our issue of July 25, will be attained, it is probable that Great Britain, France and Belgium will be well up on their estimates, bearing in mind that the effects of the measures taken to stimulate production in these countries are only beginning to be felt and will from now on bring better results.

The average daily output of hard coal in Western Germany is a little over 400,000 tonnes at present and the industry is just holding its position, but the German Coal Board will endeavour to raise the daily output to 414,000 tonnes during the third quarter of this year. Under the O.E.E.C. five-year plan, Western Germany is aiming to produce 150,000,000 tonnes of hard coal annually by 1956. A capital investment of 3,600,000,000 marks will be needed to carry out this programme but only a third of this sum can be raised within the industry itself. The West German Government is subsidizing the basic industries to the extent of 10 per cent of their capital investments but the rest of the money required by the coal industry will have to come from an external source, probably through the International Bank of Reconstruction. The French and Belgian coal industries will also require some external aid to finance their projects.

Since the beginning of the year there has been an increase of 14,500 underground workers in Great Britain and of 5,500 in West Germany. France, on the other hand, has been relying on improvement in productivity rather than on increased manpower, and the output per man-shift in the French mines during the first half of this year was 4.4 per cent higher than during the corresponding period in 1951. The lower outputs per manshift in Great Britain, Belgium and the Netherlands are stated to be due to abnormal increases in the numbers of recruits undergoing training, but who are included in the employment figures. The increase in the total Western European output has not yet affected imports from the U.S.A. It is reported from Washington that total exports of coal from the U.S.A. during the first half of the year amounted to nearly 30,000,000 tons, of which 14,070,000 tons of bituminous coal and 724,000 tons of anthracite were sent to Western European countries between January and June.

SOME PROBLEMS FACING THE AUSTRALIAN COAL MINING INDUSTRY

The annual report issued recently by the Australian Coal Board for the financial year 1950-1951 shows that the coal industry in the Commonwealth is confronted by internal difficulties due to the shortage of labour and obsolesence of mining equipment and by external difficulties due to inadequate transport and coal-handling facilities at the ports. The output of 12,700,000 tons of hard coal in New South Wales last year fell short of the demand by a wide margin and the Federal Government had to subsidize the importation of 2,250,000 tons of coal from India and the Union of South Africa to cover the deficiency in the Commonwealth as a whole. It is estimated that an output of 19,000,000 tons will be needed from New South Wales alone in 1954 and the Board are taking steps to increase open-cast production and to accelerate the mechanization of the deep mines. The State Government and the State Marine Services are also planning to deal with increased coal traffic, which already constitutes 50 per cent of the total freight carried by the railways.

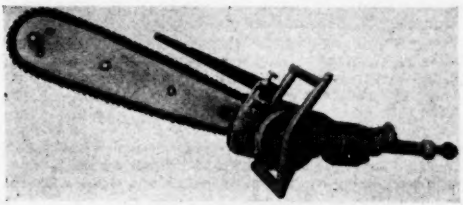
MACHINERY AND EQUIPMENT

The C.P.-Danarm Pneumatic Power Saw

A pneumatic power saw that is particularly suitable for export owing to its compact construction, light weight and variety of duties, is announced by Messrs. J. Clubley Armstrong Danarm as an addition to their range of petrol and electric power chain saws. The C.P.-Danarm Pneumatic Power Saw is a "one man" operating unit which may be converted to a two-operative machine if desired by attachment of the fittings supplied, and which is powered by a heavy duty Consolidated Pneumatic air motor.

The average weight of the unit is 29 lb. and the machine is claimed as foolproof in operation as well as efficient in its cutting speed for all varieties of timber. Owing to these considerations and because of the fact that it has applications wherever air compressors are used, the C.P.-Danarm Pneumatic Power Saw has particular uses in the mining industry. It is an obvious tool for the timberman both on surface and underground, for not only is it a conceivably important piece in face timbering operations, but it also could perform obvious duties in the construction of packs, loading boxes, incline shaft screens, and similar underground installations.

The C.P.-Danarm is a 3 h.p. machine arranged for one-man operation and normally is equipped with a cutter bar and saw chain



The C.P.-Danarm Pneumatic Power Saw

giving a cutting width of 23 in. This width enables an operator to cut timber up to 46 in. in diameter or to cross cut to a diameter of 23 in. when working from one side only. An alternative cutter bar of 16 in. cutting width is available for lighter work and for operation in confined spaces. The saw is powered by a heavy duty, vane type Consolidated Pneumatic air motor designed for 80-100 lb./sq. in. airline pressure, which contains a built-in oil chamber with needle valve control. Air consumption is approximately 50 c.f.m. at 80 lb. pressure per sq. in., and 3 h.p. is developed at 6,000 r.p.m.

Power is transmitted to the cutting chain through bevel gears housed in an aluminium casing, and having a 4 : 1 reduction ratio giving a final sprocket speed of approximately 1,500 r.p.m. Cutter bars are specially hardened and tempered, with the standard bar providing a cutting width of 23 in. and the short bar being 16 in. long with chain. The cutting chain itself is made of special heat-treated steel of new three-link design with straight cutters which have every tooth accessible for re-sharpening. Insofar as lubrication is concerned, the tubular handle grip at the front of the saw is used as an oil reservoir, and air under pressure to this reservoir forces oil on the chain saw thus ensuring constant lubrication.

Both the 22½ in. and 16 in. C.P.-Danarms have 3 h.p. and air c.m.f. of 50/60. The 22½ in. model weighs 31 lb. and the 16 in. weighs 27 lb. Lengths are respectively 47 in. and 41 in., while both models are 7½ in. wide and 12 in. in height.

Leak-proof Alkaline Caplamps

A new nylon safety vent which ensures that all alkaline caplamps can now be operated in a completely dry external condition has been introduced by Nife Batteries.

Vent leakage was found to be due to one or more of four different causes: firstly, spraying during charging; second, the pressure ejection of liquid through the vent while the lamp is in service; third, over topping-up and fourth, badly fitting seating washers. Internal gas pressure during charging is responsible for the first two, the human element for the third, and the repeated removal of vents before topping-up for the fourth. The new Nife nylon safety vent is claimed to eliminate these faults.

The opening of a Nife caplamp battery lid for charging now automatically opens the central orifice of each vent so that charging gases can escape without hindrance. The body of the vent contains two columns of unequal height and these, combined with a self-draining slot and a free gas exit, remove the possibility of electrolyte spray. At the end of the charge the cells are at atmospheric pressure and their tops completely dry.

On closing the battery lid the cells are sealed at atmospheric pressure. This ensures, in conjunction with the self-draining device, that no leakage takes place in service even though the lamp is operated for long periods in a horizontal position. It is now no longer necessary to remove the vents before topping-up, as this operation is carried out through the central orifice by means of the special Nife topping-up equipment which cuts off the flow of water automatically as soon as the correct electrolyte level is reached. Besides saving labour in the lamp room, the avoidance of the weekly removal of perhaps thousands of vents with the attendant dangers of careless replacement or badly seated washers, has removed a major cause of leakage. The introduction of the new vent system, adaptable to all Nife three-cell caplamps, makes maintenance easier and reduces costs by the absence of spillage.

New Galion Motor Graders

Two brochures from Messrs. Jack Olding & Co. Ltd. describe the New Galion Models 104 and 118 motor graders, now in course of production by Galion (Great Britain) Ltd. Both models were originally designed and built in the U.S. and are similar in design and construction. Model 118 has a 100 h.p. Leyland Diesel engine and Model 104 an 80 h.p. Leyland Diesel engine, the addition power of the Model 118 making it suitable for extra heavy duty grading.

In the New Galion range, full hydraulic control on the blade and scarifier allows instantaneous adjustments with finger-tip pressure on the controls. Other additional features, such as extra-large traction tyres of identical size at front and rear or the combination of manual and hydraulic booster steering, reduce strain and maintain production under adverse conditions. A gear-driven tandem ensures that power is transmitted to all four wheels.

The blade range with the 12 ft. moldboard is 97 in. side shift, with 90° vertical and 360° horizontal rotation, while constant mesh transmission and designed gear ratios provide the graders with a wide range of operating speeds ranging in the six inward gears of each model from approximately 1.2 m.p.h. to 21.5 m.p.h. Each model has a lifting speed of approximately 1 in. to 3 in. per second. The Model 104 weighs approximately 22,050 lb. and the Model 118 approximately 23,550 lb., both without scarifier.

Delivery of the Model 118 has already commenced and that of the Model 104 will commence during 1953. The graders have obvious applications in the mining industry for dump levelling duties and like operations.

A Range of Holman Products

Messrs. Holman Bros. Ltd. announce many of their products which have a specific interest for the mining engineer in Catalogue No. 9/2007/52. Air-cooled and water-cooled compressors of net weight ranging from 518 lb. to 750 lb. in the air-cooled models and from 1,450 lb. to 4,700 lb. in the water-cooled models, produce between 720 and 1,200 r.p.m. and vary in height from 2 ft. 5½ in. to 5 ft. 6 in. Portable air compressors, vee engines and rotomotors are presented, as well as air winches and winders intended for all manner of haulage and winding duties.

A full section of the catalogue makes a special feature of drills, which are displayed in turn from the SL and Silver handril models which weigh between 24 lb. and 84 lb. with strokes of 1⅛ in. and 2⅛ in. respectively, to the Holman hydraulic drillrig, the wagon drill, and the Dryductor.

The Dryductor is noted as having a bore of 2⅛ in. and a stroke of 2¼ in., while the Airleg is shown as having a length of feed ranging in three stages from 24 in. to 52 in. This is a comprehensive booklet of a wide range of equipment.

METALS, MINERALS AND ALLOYS

The U.S. Munitions Board has valued the national stockpile of critical and strategic materials at $3,565,390,655 as at June 30 last. In addition at that date nearly two billion dollars worth of materials were under contract for delivery to the stockpile. The Board states that plans announced to date call for the accumulation of seven-and-three-quarter billion dollars worth of material. On this basis orders amounting to at least another two billion dollars have still to be placed.

The report suggested that among previously scarce metals antimony, cadmium, lead and zinc were being acquired more easily while copper, aluminium and nickel were still in too tight supply to permit of much stockpiling, although the Board expected to be able to purchase more of these metals next year.

With the announcement in Moscow this week of the plans for an All-Union Congress of the Communist Party to be held next October, some interesting target figures have been given for the current five-year plan ending 1955. Adding target percentage increases to production figures for the 1945/50 period, it would appear that by 1955 the U.S.S.R. plans to be producing nearly 70,000,000 tons of oil, 44,000,000 tons of steel, and 34,000,000 tons of pig iron. The fuel and power targets include 373,000,000 tons of coal and 162,000,000 kilowatt hours of power.

COPPER.—U.S. copper demand has remained firm this week with foreign metal at 36½c. and domestic copper at 24½c. August deliveries are sold out and September allocations were announced on Wednesday. These total about 77,000 s.tons domestic and 55,000 s.tons foreign copper. The apparent continued shortage of scrap copper has no doubt been partly responsible for the market's firmness.

The Chilean Central Bank announced this week that it has sold 110,000 tons of metal since it became Chile's sole seller in early May. All of this has gone to the U.S. except for 2,500 tons sold to Western European countries this week at 35.5c. Chilean production in the same period may have been as much as 130,000 tons.

It is rumoured from Santiago that, following talks between Anaconda officials and the Chilean President, the U.S. Government may authorize European countries to use American Aid funds to buy Chilean copper at 35½c. a lb.

Calumet and Hecla will reopen its Osceola mine in Michigan following an agreement with D.M.P.A., in order to replace production from several of the company's mines which are nearing exhaustion. The agreement guarantees a minimum price of 25½c. per lb. over the next ten years and is expected to yield about 53,000 s.tons of copper. Calumet and Hecla is finding the capital for opening up the mine. This operation will take about two-and-a-half years and involves one of the largest mine pumping operations ever undertaken.

LEAD.—Contrary to pessimistic forecasts of lead supplies from such authoritative sources as the Paley Report, the U.S. Lead Industries Association has recently published the results of a study which draws reassuring conclusions both of the immediate supply position and the long-term prospect. The Association points out that the estimated domestic reserves of lead in 1950 were higher than in 1944 despite the fact that nearly 2,500,000 tons of lead had been mined in the interval. The report further points out that only 11¼ per cent of U.S. lead supplies come from outside the North American continent.

With regard to the severe lead shortage which threatened at the end of last year, the Association characterizes this as having been purely artificial and based on maldistribution. It might usefully be added that if the U.S. had not placed a ceiling price on lead, supplies would not have been diverted elsewhere, and the "artificial" shortage would never have occured at all.

After last week's activity in September business, when 11,500 tons were sold, the U.S. lead market has been quiet the early part of this week. Prices remain unchanged at 16c. spot New York and 15.80c. spot East St. Louis.

The Stolberger Zinc Co. is to embark shortly on an extensive new lead-zinc mining venture in the Kuferather Valley of West Germany, it is estimated that there are between 500,000 and 750,000 tons of pure metal in the area of which two-thirds are lead and the remainder zinc. The mine will be mainly an open cast working and a daily output of between 2,000 and 3,000 tons of ore is planned.

TIN.—The London price of spot tin is back to around the £960 per ton which was ruling immediately prior to the announcement of the U.K. Government's completion of its purchases for the 20,000 ton U.S. contract. It is difficult to assess how far this recovery is due to the existing rather low level of official warehouse stocks and how far it reflects a bullish tendency based on the belief that U.S. stockpile purchases will absorb the whole of this year's surplus production.

The two-and-a-half month strike at the Texas City tin smelter has been settled following the signing of a new contract between the tin processing corporation and the Union. The smelter is expected to return to normal operations in about ten days.

It is reported from Johannesburg that a new tin mine at Zustershoek near Pretoria will commence production next month.

No further news has emerged this week of the Bolivian tin negotiations, which were resumed recently in Washington.

ZINC.—The U.S. zinc trade this week has been awaiting clarification of the Government's plan to support prices with stockpile purchases so as to discourage the shut-down of marginal domestic mines. In the absence of such a plan it is thought that zinc may weaken again below the 14c. level.

Continental prices still remain weak at around £105 a ton g.o.b.

An aspect of the zinc price to which the *Financial Times* drew attention recently is that, in the case of many eastern mines, freight rates, both internal and ocean, are now such as to render uneconomic the shipment of low-grade ores. This source suggests that low-grade ores worth less than around £25 a ton c.i.f. Europe would be uneconomic. To a limited extent this situation is being met by upgrading low grade ores by calcining on the mine site.

The new orders removing controls on the use of zinc in the U.K., foreshadowed here last week, became effective on Wednesday. Prohibitions on the use of copper and copper-based alloys remain in force, but the new orders will permit the use of copper and copper alloys for brazing, soldering and welding articles in the manufacture of which these metals are otherwise prohibited. Outside of galvanizing and die casting the uses of unalloyed with copper zinc are not great, and it is these two classes of user to stand to benefit most from the new orders.

ALUMINIUM.—Aluminium production in Western Germany has risen from around 5,500 tons in February to a current monthly average of 9,000 tons. Even so production is only sufficient to meet the most urgent demands. A third electrolytic plant recently resumed operations at the Luenen works of the Vereinigte Aluminium Werke, bringing total annual output of these works to 28,000 tons, using bauxite from Yugoslavia, Greece and Indonesia. Further increase of output there is at present limited by power supplies. The dismantled Rhineland foundry at Erft is being rebuilt and, it is hoped, will be producing 10,000-12,000 tons per annum within twelve months.

COLUMBITE.—The development of the columbite ore deposits in Telemark, Northern Norway, is to start in the autumn. Ore output is expected to reach 40,000 tons in the first year, but the grade of the material is not given in the report.

MANGANESE.—At the beginning of this month D.M.P.A. signed an agreement with the Manganese Chemicals Corporation of Minneapolis calling for the erection of a plant to treat at least 200 l.tons of manganiferous ores per day. If this new "prototype" plant is successful it will pave the way for the recovery of manganese from vast deposits of low-grade ores in the Cuyula range in Minnesota. Many attempts have been made in the past to recover manganese from these ores but hitherto have been largely experimental. The present agreement which visualizes an annual production of around 450,000 l.ton units of manganese is the first operation attempted on a semi-commercial scale.

A chemical leaching process known as the ammonium-carbonate or Dean process will be used instead of the accepted method of gravity concentration. D.M.P.A., in addition to loaning £1,500,000 toward the cost of the plant, has guaranteed the company a floor price of $2.35 per unit during the first six months for any unsold metal and thereafter will be willing to buy on a cost-plus basis.

MERCURY.—The New Idria Mining & Chemical Co. of California, is to receive a D.M.P.A. exploration assistance loan to

seek new quicksilver ore bodies in the New Idria mine in San Benito County. This mine was the largest quicksilver producer in the last war but subsequently was shut down when the price declined.

SULPHUR.—The N.P.A. has decontrolled sulphuric acid and is expected to ease its sulphur controls in other directions.

TITANIUM.—Because of the important titaniferous deposits on the east coast of Australia and in Western Australia the Australian Government has undertaken a special research programme for Britain into the use of titanium as an alloying metal. The potentialities of this metal have recently been discussed at length in these pages (see *The Mining Journal* July 18, page 68, and July 25, page 95).

URANIUM.—The Australian Government has invited Mount Isa Mines to work the uranium deposits at Rum Jungle. The company is reported to have replied that it will only take on the project if it otherwise threatens to go by default. That Mount Isa, which is controlled by the American Smelting & Refining Co., has received this request provides perhaps further evidence of the difficulty of interesting Australian risk capital in its own high cost mining industry, a state of affairs to which our Melbourne correspondent has repeatedly drawn attention.

GOLD.—South African gold production in July totalled 1,010,978 f.oz. compared with 977,527 in June and 978,402 in July a year ago.

Ontario gold output during the first six months of this year amounted to 1,229,729 f.oz. compared with 1,239,673 in the corresponding period of 1951.

Permission has now been given for the sale of Australian fine gold on the premium market. Previously only processed gold could be sold at a premium. The saving in processing costs through this relaxation has been estimated at up to 2s. an oz.

SILVER.—Between now and the end of the year the Japanese Government is reported to be planning to sell 100 tons of silver in the American market. These sales are stated to serve the double purpose of raising funds for the government purchase of domestically mined gold and of removing the pressure of government-held silver stocks.

The London Metal Market

(From Our Metal Exchange Correspondent)

Since Thursday of last week the price of tin in the London market has risen steadily, and now shows an appreciable recovery from the lowest price reached in the early days of this month. Stocks of tin on warrant are none too large for the market, and following a moderate shrinkage in these last week, the backwardation has widened substantially and now stands at around £15 per ton.

In the East the market has pursued much the same course as in London. There has been a little more enquiry from the Continent and a persistent demand for Straits tin already afloat, but supplies of this are none too plentiful and command a premium. American consumers are reported to have been buying tin for near and forward delivery.

It has been announced by the Government that the Ministry of Materials and the London Metal Exchange have agreed that lead dealings on the London Metal Exchange will commence on October 1, and that the Ministry will make no further contracts for sales to consumers after September 30. In the meantime the lead market is very quiet as is also the case in copper and zinc.

On Thursday the official close on the tin market was: Settlement price £962, Cash Buyers £961, Sellers £962; Three months Buyers £939, Sellers £941. In the afternoon the market was very steady. Turnover for the day was 95 tons. Approximate turnover for the week was 675 tons.

The Eastern price on Thursday morning was equivalent to £963 5s. per ton, c.i.f. Europe.

Iron and Steel

The steel shortage is much too acute to be readily overcome. But a progressive expansion of supplies can now be envisaged. Bigger tonnages of semi-finished steel for the re-rolling mills are now coming to hand from the Continent and in the four remaining months of this year it is still hoped to complete the shipment of a million tons of American steel to this country. These, however, are merely temporary expedients to bridge the gap between supply and demand. Hopes of a progressive expansion of ingot production in the British steel plants are now firmly based.

Pig iron production last month was running at an annual rate of 1,000,000 tons in excess of July, 1951, and this in turn enabled the steel plants to achieve a much-increased output of ingots and castings. With the end of the holiday period the rising trend is expected to continue. Stocks of raw materials have been increased; even scrap is a little more plentiful and five of the eight new blast furnaces planned for completion this year are now in full production. Yet one more—at Lysaghts—is almost ready to be blown in and two more will be fired in December.

The principal steel users have been encouraged to expect bigger allocations in the fourth period but disappointment is expressed with the extent of the indicated increases.

It is clearly the intention to accord preferential treatment to industries catering for overseas trade. But in many cases, as for instance in the shipyards, it is difficult to differentiate and equally important claims are made by the light and heavy engineering industries, tube makers, power plant producers and builders of locomotives and wagons.

In all these trades there is no hint of recession; on the contrary, with more liberal supplies of steel, outputs could be substantially increased. Export business is still restricted by financial difficulties, but the world demand for steel is very extensive and a brisk autumn trade is foreshadowed. British prices are at a keenly competitive level and disposal of maximum outputs presents no difficulty.

AUGUST 21 PRICES

COPPER

Electrolytic	£285 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid	£131 0 0 d/d
Soft empire	£131 0 0 d/d
English lead	£132 10 0 nom.

ZINC

G.O.B. spelter, foreign, duty paid ...	£122 0 0 d/d
G.O.B. spelter, domestic...	£122 0 0 d/d
Electrolytic and refined zinc	£126 0 0 d/d
Special high grade	£128 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over	£225 per ton
Crude (70%)	£210 per ton
Ore (60% basis)	25s./27s. 6d. nom. per unit, c.i.f.

NICKEL

99.5% (home trade)	£454 per ton

OTHER METALS

Aluminium, £157 per ton.	Osmiridium, £35 oz. nom.
Bismuth, 18s. lb. (min. 2 cwt. ex-warehouse).	Osmium, £70 oz. nom.
	Palladium, £8 10s. oz.
Cadmium, (Empire) 14s. 4d. lb.	Platinum, £27/33 5s. nom.
Chromium, 6s. 5d. lb.	Rhodium, £45 oz.
Cobalt, 20s. lb.	Ruthenium, £30 oz.
Gold, 248s. f.oz.	Quicksilver, £64 10s. ex-warehouse
Iridium, £65 oz. nom.	
Magnesium, 2s. 10½d. lb.	Selenium, 25s. nom. per lb.
Manganese Metal (96%-98%) 2s. 2d./2s. 3d. per lb. d/d	Silver 73d. f.oz. spot and f'd.
	Tellurium, 18s./19s. lb.

ORES, ALLOYS, ETC.

Bismuth	20% 3s. 6d. lb. c.i.f. 65% 9s. 6d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£14 2s. per ton c.i.f.
,, ,, (concentrates)	£14 2s. per ton c.i.f.
,, ,, Refractory	£13 14s. per ton c.i.f.
Baluchistan Metallurgical ...	£15 8s. per ton c.i.f.
Magnesite, ground calcined ...	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Molybdenite (85% basis) ...	105s. 10d. per unit c.i.f.
Wolfram (65%)	425s. c.i.f. U.K. buying
,, ,, ...	447s. 6d. d/d U.K. selling
Tungsten Metal Powder (for steel manufacture) ...	31s. 7d. nom. per lb. (home)
Ferro-tungsten	28s. 7d. nom. per lb. (home)
Carbide, 4-cwt. lots	£32 3s. 9d. d/d per ton
Ferro-manganese, home ...	£43 15s. 2d. per ton
Manganese Ore U.K. (48% - 50%)	6s. per unit
Brass Wire	2s. 9d. per lb. basis.
Brass Tubes, solid drawn ...	2s. 3½d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Gilt-edged stocks were again firm and reflected a recovery of confidence. Prices are back to the level at which they stood before Mr. Churchill's warning on the financial situation. This improvement was probably based on Mr. Butler's statement that the rate of drain of reserves has been checked and that the rapid credit expansion is under control. This was taken to mean that a further increase in the bank rate is unlikely, at any rate for the present. Some small institutional interest in the market was reported for the first time for some weeks.

Mining shares were generally better although business remained at a low ebb. The O.F.S. led the market. Interest in this section reawakened in Johannesburg and Free State Geduld were active after the new issue. Western Holdings jumped on rumours of good results. During the next few months this area should receive important news of underground development. It will be recalled that phenomenal borehole indications came from this part of the field in the early days. Most other O.F.S. issues followed suit. Some quarters of the market anticipate a switching of speculative interest from foreign bonds into this section during the next few weeks.

Rand gold shares were generally better where changed, definite preference being shown for potential uranium producers. Most leading finance houses also hardened. In Johannesburg hopes were expressed that the next I.M.F. meeting will reconsider the gold price question. These hopes seem to be based on the fact that the United States finances are now nearer the position where some adjustment might work out favourably for them. The extension of the civil disobedience campaign in South Africa, which has received wide press publicity, has undoubtedly caused a check on this market.

Among miscellaneous gold shares, Cam & Motor jumped on the good results announced for the June quarter. On No. 38 level an average of 21.7 dwt. gold per ton over 47 in. for 65 ft. advanced was disclosed in a winze. Favourable developments were also reported from the 39th level. St. John d'El Rey eased on the more difficult financial condition of Brazil, whose government has recently been placing restrictions on foreign owned companies operating in the country.

Copper shares were quiet but finished on a firmer note with the opening of the new account. Tanks jumped on the announcement that the question of the chairmanship of the company has at last been decided. Sir Ulick Alexander was elected chairman and Sir Ernest Oppenheimer has been appointed a director. Rhodesia Katanga came in for some speculative demand and the price went ahead. Some other copper shares also improved, notably Messina and Rhodesian Anglo American on anticipated earnings figures.

Tin shares recovered from their recent decline. The firmer price of the metal caused this movement. Among Nigerian shares, Jantar and Amalgamated Tin, the principal columbite producers, were still the most favoured. Beralts rose on anticipation of good development results. Reports from Lisbon suggest that a boom in wolfram and tin is taking place and that some small mines are being re-opened.

Lead/zinc shares were patchy. The lower continental price of the metal had a depressing effect on the market. Exceptionally, Mount Isa went ahead on encouraging reports concerning the copper and lead ore reserves.

Miscellaneous base metals recorded a further demand for asbestos producers. Consolidated Murchison eased on the lower quarterly figures but later finished firm on bear closing. Wankie Colliery encountered some profit-taking after the recent rise. Dollar shares mostly fell on the weaker trend in Wall Street. Reports from New York suggest that some decline in the internal demand for consumer goods is taking place.

Diamond shares lacked zest, but De Beers Preferred Bearer shares went ahead on recognition of their investment merits. The interest is covered many times over and the yield approaches 7 per cent.

FINANCE	Price Aug. 20	+ or − on week
African & European	2½	+¼
Anglo American Corpn.	6⅞	−⅛
Anglo-French	20/-	
Anglo Transvaal Consol.	25/-	
Central Mining (£1 shrs.)	37/6	+6d
Consolidated Goldfields	46/10½	+1/10½
Consol. Mines Selection	25/-	
East Rand Consols	2/7½	+1½d
General Mining	4¼	+⅛
H.E. Prop.	32/6	
Henderson's Transvaal	9/9	
Johnnies	2¼xd	+⅛
Rand Mines	4¼	
Rand Selection	40/7½	−7½d
Strathmore Consol.	29/9	+1/-
Union Corp. (2/6 units)	36/3	+7½d
Vereeniging Estates	3⅛	
Writs	33/1½	
West Wits	46/10½	+2/6
RAND GOLD		
Blyvoors	44/-	
Brakpan	18/-	
City Deep	34/4½	
Consol. Main Reef	33/1½	−7½d
Crown	43/9	−1/3
Daggas	3½	+⅛
Doornfontein	27/9	+3d
Durban Deep	3½	+⅛
E. Daggas	19/-	−1½d
E. Geduld ... (4/- units)	46/3	−9d
E. Rand Props	4¼	+⅛
Geduld	6⅜	
Govt. Areas	12/9	+3d
Grootvlei	31/3	+3d
Libanon	13/6	+3d
Luipaards Vlei	21/6	
Marievale	21/6	
Modderfontein East	23/9	
New Kleinfontein	29/4½	+7½d
New Pioneer	18/9	+1/9
Randfontein	22/10½	+4½d
Robinson Deep	12/3	
Rose Deep	25/7½	−7½d
Simmer & Jack	6/4½	
S.A. Lands	38/1½	−1/3
Springs	7/4½	
Stilfontein	26/4½	+1½d
Sub Nigel	2½	+⅛
Van Dyk	13/-	
Venterspost	20/-	+3d
Vlakfontein	17/9	
Vogelstruisbult	29/9	+1/-
West Driefontein	8⅜	+⅛
W. Rand Consolidated	34/4½	+1/9
Western Reefs	43/1½	+1½d
O.F.S.		
Freddies	7/7½	+10½d
Freddies N.	7/9	+1/-
Freddies S.	7/3	+6d
F.S. Geduld	2⅜	−⅛
Geoffries	17/6	−1/3
Harmony	19/3	+7½d
Loraine	7/4½	+7½d
Lydenburg Estates	10/9	+3d
Merriespruit	4/-	
Middle Wits	16/-	+7½d
Ofsits	42/9	+2/-
President Brand	20/6	+1¼d
President Steyn	18/10½	+1/10½
St. Helena	17/-	+6d
U.F.S.C. & G.	6/9	+4½d
Virginia Ord.	12/-	+4½d
Welkom	25/7½	+1/1½
Western Holdings	3⅜	+⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/7½	
Ariston	5/7½	
Ashanti	18/-	+3d
Bibiani	6/6	
Bremang	2/4½	−1½d
G.C. Main Reef	3/7½	
G.C. Selection Trust	7/-	+4½d
Konongo	2/7½	+1½d
Lyndhurst Deep	1/1½	
Marfa	1/-	
Taquah & Abosso	3/6	+3d
AUSTRALIAN GOLD		
Boulder Perseverance	2/3xd	
Gold Mines of Kalgoorlie	9/-	
Great Boulder Prop	5/4½	
Lake View and Star	16/-	−1½d
Mount Morgan	19/1½	−1½d
North Kalgurli	12/-xd	−3d
Sons of Gwalia	6/9	
South Kalgurli	8/-	−3d
Western Mining	8/6	−1½d
MISCELLANEOUS GOLD		
Cam and Motor	40/7½	+7½d
Champion Reef	7/3	+3d
Falcon Mines	9/-	+3d
Globe & Phoenix	24/6	
G.F. Rhodesian	6/9	+3d
London & Rhodesian	4/7½	+1½d
Motapa	2/3	
Mysore	4/1½	+1½d
Nundydroog	6/3	+3d
Ooregum	2/10½	
Oroville	11/3	

MISCELLANEOUS GOLD (contd.)	Price Aug. 20	+ or − on week
St. John d'El Rey	23/9	−6d
Zams	36/6	
DIAMONDS & PLATINUM		
Anglo American Inv.	4½	+½
Casts	28/9	
Cons. Diam. of S.W.A.	4	
De Beers Defd. Bearer	66/3	−3d
De Beers Pfd. Bearer	14⅜	+⅜
Pots Platinum	10/3	+6d
Watervaal	16/-	+4½d
COPPER		
Chartered	60/4½	−4½d
Esperanza	3/10½	−3d
Indian Copper	3/10½	−1½d
Messina	4⅜	+⅛
Nchanga	7⅜	
Rhod. Anglo-American	58/6	+3d
Rhod. Katanga	12/4½	+3d
Rhodesian Selection	17/10½	+1½d
Rhokana	21½	−¼
Rio Tinto	25¾	−¼
Roan Antelope	13/9	−7½d
Selection Trust	41/3	−7½d
Tanks	66/6	+10½d
Tharsis Sulphur Br.	43/9	−2/6
TIN (Eastern)		
Ayer Hitam	23/1½	+1½d
Bangrin	7/3	+1½d
Gopeng	10/3	+1½d
Hongkong	6/6	
Ipoh	21/-	+1/-
Kamunting	10/3	−1½d
Kepong Dredging	7/3	
Kinta Tin Mines	12/6	
Malavan Dredging	21/-	+6d
Pahang	15/1½	+7½d
Penjom	9/6	
Petaling	14/3	
Rambutan	11/6	
Siamese Tin	20/3	+9d
Southern Kinta	15/9	+3d
S. Malavan	23/3	+9d
S. Tronoh	13/1½	
Sungei Kinta	17/9	+1/3
Tekka Taiping	6/10½	
Tronoh	22/3	+10½d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	10/3	+1½d
Beralt Tin	24/9	+2/1½
Bisichi	4/1½	
British Tin Inv.	15/1½	+4½d
Ex-Lands Nigeria	4/9xd	

TIN (Nigerian and Miscellaneous) contd.	Price Aug. 20	+ or − on week
Geevor Tin	12/-xd	−6d
Gold & Base Metal	3/6	+6d
Jantar Nigeria	9/3	+4½d
Jos Tin Area	10/-	
Kaduna Prospectors	3/9	
Kaduna Syndicate	5/3	
London Tin	5/4½	
United Tin	2/6	+3d
SILVER, LEAD, ZINC		
Broken Hill South	48/-	−6d
Burma Corporation	1/9	+1½d
Consol. Zinc	28/6	−1/-
Lake George	15/1½	+1½d
Mount Isa	37/6	+9d
New Broken Hill	26/9	−9d
North Broken Hill	55/6	−6d
Rhodesian Broken Hill	16/7½	+4½d
San Francisco Mines	31/-	
Uruwira	4/9	−1½d
MISCELLANEOUS		
BASE METALS & COALS		
Amal. Collieries of S.A.	47/6	+6d
Associated Manganese	46/9	+1/9
Cape Asbestos	19/1½	+4½d
C.P. Manganese	47/9	
Consol. Murchison	28/-	+1/6
Mashaba	8d	
Natal Navigation	3½	−⅛
Rhod. Monteleo	13/9	+1½d
Turner & Newall	87/6	+2/3
Wankie	18/9	−9d
Witbank Colliery	2⅜	
CANADIAN MINES		
Dome	$41	+$1
Hollinger	$31½	−$⅛
Hudson Bay Mining	$121	+$3
International Nickel	$85½	−$1½
Mining Corpn. of Canada	£5⅛	+£⅛
Noranda	$155	−$3
Quemont	£8⅛	
Yukon	4/3	−1½d
OIL		
Anglo-Iranian	6	+⅛
Apex	44/4½	+1/3
Attock	23/9	
Burmah	45/7½xd	+1/6
Canadian Eagle	35/-	−4½d
Mexican Eagle	22/7½	
Shell (bearer)	4⅜	+⅛
Trinidad Leasehold	28/6	−3d
T.P.D.	29/4½	
Ultramar	29/9	+2/10½

COMPANY NEWS AND VIEWS

W.M.C's Dividend Income Lower

The Western Mining Corporation group of companies is one of the largest organizations in the gold mining industry in Australia and also one of the youngest, Western Mining Corporation Ltd. having been formed in 1933 to operate along much the same lines as the South African mining-finance houses.

Year to Mar. 31	*Dividend Income* £A	*Gross Revenue* £A	*Expenses* £A	*Net Profit* £A	*Dividend* d.A	*Forward Balance* £A
1952	61,679	91,654	17,748	71,439	6d.	488,876
1951	106,922	128,152	26,541	101,611	6d.	487,296

The feature of the report and accounts of Western Mining Corporation for the year to March 31, 1952, was the reduction in dividend income received from Central Norsemen Gold and Gold Mines of Kalgoorlie (Aust.) during Western Mining Corporation's financial year. (Central Norseman paid a dividend of 9d. plus 3d. bonus making 1s. per share on June 30 last, which will appear in W.M.C's accounts for the current year, ending March 31, 1953).

Nevertheless, the distribution was maintained at 6d. per 5s. share on the £698,588 issued capital leaving the forward balance slightly stronger than in the previous year.

Western Mining Corporation's interests extend throughout Australia and together with Gold Mines of Australia act as general managers to the various companies in the W.M.C. group. The following table shows the Corporation's interest as at March 31, 1952.

Company and Issued Capital	*Issued Capital Held* %	*Year to March 31*	*Net* Profit* £A	*Forward Balance* £A	*Dividend*
Gold Mines of Australia	62	1952	3,356	22,347	—
£A52,219 (2s. 6d.)	62	1951	2,697	18,991	—
‡New Coolgardie	62	1952	58,217	129,875	—
£426,000 (10s.)	62	1951	83,859	81,629	—
‡Central Norsemen	50	1952	207,987	260,834	6d.A
£650,000 (5s.)	50	1951	115,929	117,869	9d.A
‡Central Victoria Dredg.	50	1952	48,026	100,384	—
£A390,000 (10s.)	50	1951	33,253	52,358	—
Victoria Gold Dredging	44	1952	Dr.1,863	54,108	—
£A129,500 (£1)	44	1951	Dr.4,792	55,971	—
‡Gold Mines of Kalgoorlie	30	1952†	79,181	40,067	6d.A
(Aust.) £A768,438 (10s.)	30	1951‡	163,290	37,979	2s. †stg.
Kalgoorlie Southern.....	20	1952			
£740,900 (5s.)	20	1951	Prospecting company.		
‡Great Western Consol....	14	1952	Operations expected to		
£1,768,000 (10s.)	14	1951	begin in October.		

*After tax. ‡Operating company.

†Company reconstituted in Australia on October 9, 1951 as Gold Mines of Kalgoorlie (Aust.) Ltd. and results refer only to period October 10, 1951 to March 3, 1952.

Drilling results obtained by Kalgoorlie Southern Mines, the company recently formed by Gold Mines of Kalgoorlie, to test for a southern extension of the Kalgoorlie goldfield are of special interest as they reveal that the structures of the Kalgoorlie goldfield as well as its mineralization continue southwards. A further consequence was the suggestion that a second layer of quartz dolerite may exist within mining depth along the eastern side of the Kalgoorlie goldfield, and Gold Mines of Kalgoorlie (Aust.) is drilling to test this objective.

Maiden Report of Gold Mines of Kalgoorlie (Aust.)

The first annual report and accounts of Gold Mines of Kalgoorlie (Aust.)—the Australian registered company formed to take the place of the former U.K. registered company of the same name—covers the period of operations undertaken since the date of its reconstruction, namely, October 10, 1951, to March 31, 1952.

During this period of just less than six months, the company showed a working profit of £A87,014, a net profit of £A79,181 and paid its maiden dividend of 6d. per 10s. share.

But mining operations were, of course, continuous throughout the year. And taking the results recorded by the former company, Gold Mines of Kalgoorlie, from April 1, 1951, to October 9, 1951, together with the results of the new company, it is revealed that tonnage milled during the year ended March 31, 1952, at 170,111 tons contrasted favourably with the preceding year's figure of 163,108 tons. Production, too, was higher, 46,739 oz. against 42,670 oz., as was the gross revenue of £753,315 against £666,028. These are encouraging improvements but in the face of rising costs which demanded no less than £559,181 compared with £450,175, net profit for the year wilted to £180,616, or some £24,000 less than in 1951 when net earnings were £204,810.

The steep advance in costs was due to increases in the basic wage rate, together with its effect on the prices of stores, the report states. The wages problem is out of the control of the company and depends on the economic health of the country so that it is possible that labour costs may go even higher in the future. While this is largely conjecture, the same cannot be said about the effect which the exhaustion of the company's low cost ore from the open cuts will have on future mining costs. For, in the past, this source of low cost ore helped materially to keep costs down.

On the other hand, the company received £21,436 additional revenue from premium gold sales made between November, 1951 and March 31 last, so that if the free market price is maintained at not less than its current quotation of around $37.50 per oz., the additional revenue from this source should go some distance towards offsetting any further rise in costs.

A distinctly encouraging feature of the report was the improvement in the ore reserve position which at March 25, 1952, was estimated at 486,000 tons of proved and probable ore averaging 6.3 dwt. compared with 480,000 tons averaging 5.6 dwt. per ton.

The annual meeting will be held in Melbourne on September 3. Sir Walter Massy-Greene is chairman.

North Kalgurli (1912) Earns and Pays Less

North Kalgurli (1912) have announced in a preliminary statement the payment of a final dividend of 9d. per 2s. share on its £110,000 issued capital, making, with the interim distribution of 6d. per share, a total payment for the year ended January 1, 1952, of 1s. 3d. per share, or 62½ per cent against 100 per cent in the preceding year.

Although no operating results were given in the preliminary statement, from the monthly output returns it would appear that the mill treated approximately 252,000 tons for a yield of approximately 58,928 oz. compared with 244,066 tons yielding 59,063 oz. in 1951. While this comparison indicates a lower grade of ore treated during the year it would not account for the 50 per cent reduction in profits. But from all the evidence available from other companies operating in Australia, no doubt the company has also had to suffer large increases in labour costs, stores and power charges, while the fact of its being a U.K. registered company means the usual heavy burden of taxation.

Year to Jan. 1	*Tax* £	*Net Profit* £	*Brought Forward* £	*Available Balance* £	*Dividend* £	*Carry Forward* £
1951	113,200	88,005	38,523	126,528	59,125	42,403
1952	48,882	44,428	42,403	86,831	36,094	50,737

The dividend will be paid on October 2. The annual meeting will be held in London on October 1. Mr. C. T. Ley is chairman.

Inco Earns $2.23 Per Share Against $1.94 in First Six Months

The interim report of The International Nickel Co. of Canada Ltd., and subsidiaries for the six months ended June 30, 1952, issued by Dr. John F. Thompson, Chairman of the Board of Directors, shows net earnings in terms of U.S. currency of $33,538,227 after all charges, depreciation, depletion, taxes, etc., equivalent, after preferred dividends, to $2.23 per share on the common stock. For the corresponding period in 1951 the net earnings were $29,385,046, or $1.94 per share of common.

In the three months ended June 30, 1952, net earnings were $17,191,909, equal to $1.15 a share on the common, compared with $16,346,318 or $1.08 per share of common, in the first quarter of 1952 and $14,653,656, or 97c. per share of common, in the second quarter of 1951.

"West Africans" Consolidate Their Position

In the table accompanying this note, the July mine returns for the West African gold mines are shown, together with the cumulative results to date from the beginning of each company's current financial year, and these are compared with the corresponding cumulative totals for the same period of the preceding year.

The general picture presented from the July returns is that it was a fairly average month. Ashanti Goldfields was, however, an exception and the drop in mill throughput to about half the average monthly capacity was due to a strike of African labour which stopped all production between July 10 and 23.

Konongo Gold, it appears, continued to work high-grade ore from its Boabedroo section, and although its monthly tonnage throughput is small profits remain at a highly satisfactory figure per ton.

Taquah & Abosso, on the other hand, showed a deficit for the tenth month in succession and its cumulative losses for the first four months of the current year are in the region of £39,000, which compares with a profit in the corresponding period of the preceding year of approximately £24,000.

Comparing the current financial year's results to date with those of the corresponding period in the preceeding year it is seen that only two companies, Ariston Gold and G.C. Main Reef, have achieved better profit figures, due in both cases to the higher grade of ore treated.

Company	July, 1952 Tons (000)	Yield (oz.)	Profit* (£000)	No. of Months	Current Financial Year Total to Date Tons (000)	Yield (oz.)	Profit* (£000)	Last Financial Year Total to Date Tons (000)	Yield (oz.)	Profit* (£000)
Amalgamated Banket Areas	57	9,078	24.9	10	512	84,866	204	540	78,303	273
Ariston Gold	27	9,760	50.4	10	273	94,885	466	272	84,670	446
Ashanti Goldfields	10	8,536	51.8	10	184	137,390	690	197	159,286	893
Bibiani(1927)	30	5,528	18.5	10	299	58,991	143	292	61,991	168
Bremang ‡	586	2,790	14.5	7	4,306	21,665	105	5,187	23,213	122
Gold Coast Main Reef	8	3,018	7.5	1	8	3,018	7	8	2,697	6
Konongo Gold ...	3	2,221	10.5	10	25	21,773	96	33	24,110	101
Marlu Gold	33	3,441	7.0	10	394	36,724	76	393	36,722	90
Nanwa Gold	2	555	N/A	7	19	4,864	N/A	14	1,986	N/A
Taquah and Abosso ...	21	4,897	L8.8	4	84	19,012	L39	85	20,783	24

*Including premium revenue since November, 1951. As the basis of calculating monthly profit varies from company to company a direct comparison one with another is not possible. The basis for any one company has, however, remained consistent, unless otherwise indicated.

‡Ore treated given in cu. yd. L indicates a loss.

"Indians" Make Steady Progress

The table below, giving tonnage throughput and yield of the four Indian gold mines together with the cumulative results to date and those of the corresponding period in the preceding year, has been arranged in the same way as the table for the West African gold mines shown above. The Kolar Goldfield Companies do not, however, publish monthly profit figures.

Tonnage milled and output of Champion Reef and Nundydroog during July call for little comment, the figures recorded being much on a par with the monthly averages obtained during the current financial year. But Ooregum, despite a lower than average mill throughput, achieved the highest monthly output since November 1950.

Mysore continued to improve its position and results for the first four months of the current financial year show a healthy contrast to the corresponding results achieved in the preceeding year. In fact, of these four mines, only Champion Reef recorded a lower total tonnage and yield compared with the last financial year.

Company	July, 1952 Tons (000)	Yield (oz.)	No. of Months	Current Financial Year Total to Date Tons (000)	Yield (oz.)	Last Financial Year Total to Date Tons (000)	Yield (oz.)
Champion Reef	12	5,933	4	52	23,652	59	24,103
Mysore	18	6,531	4	71	25,434	66	20,305
Nundydroog* ...	20	5,655	4	85	21,577	76	18,981
Ooregum	10	3,314	4	43	12,555	42	10,953

*Includes tailings.

Harrietville (Tronoh) Resume Dredging

Harrietville (Tronoh) has announced that the dredge bucket band, which parted on June 19, has been reconnected and dredging operations were resumed on August 11.

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Mining Men

The Rt. Hon. Sir James Ulick Francis Canning Alexander has been elected chairman of Tanganyika Concessions. **Sir Ernest Oppenheimer** has been elected a director of the company.

Mr. A. T. Barnes has been appointed a director of Kay Tin Mines (Kinta) in place of Mr. D. B. W. Markham who has left the Board.

Mr. R. E. M. Blakeway has been appointed a director of Rose Deep.

Mr. A. W. Boustred has been appointed underground manager at Halkyn District United Mines.

Mr. N. K. S. Brodribb has been appointed a director of the Mount Lyell Mining & Railway Co.

Mr. R. B. Caples has been re-elected president of The American Zinc Institute.

The death is announced of **Mr. W. J. Fidridge,** a director of Tindals Gold Mines.

Professor A. M. Gaudin, of the Massachusetts Institute of Technology, will deliver the third Sir Julius Wernher Memorial Lecture on Monday, September 22, at 5 p.m. at the Royal Institution, Albemarle Street, London, W.1. The lecture will be open to the public and admission will be free.

Mr. James Westfield has been appointed chief of the Health & Safety Division of the U.S. Bureau of Mines at Washington.

The Climax Rock Drill & Engineering Works Ltd. have announced the opening of a new Sales, Service and Spares Branch Office at High Road, Earlsheaton, Dewsbury. Telephone: Dewsbury 2190. The branch manager is Mr. R. Sheffield.

The Annual Metal and Non-Metallic Mineral Mining Convention and Machinery & Supply Exposition of the American Mining Congress will be held in the City Auditorium, Denver, Colorado, from September 22-25, both days inclusive.

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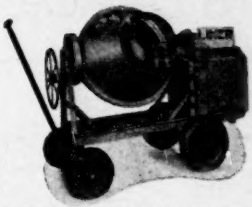

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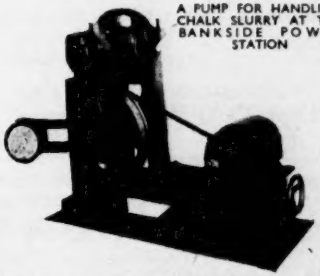

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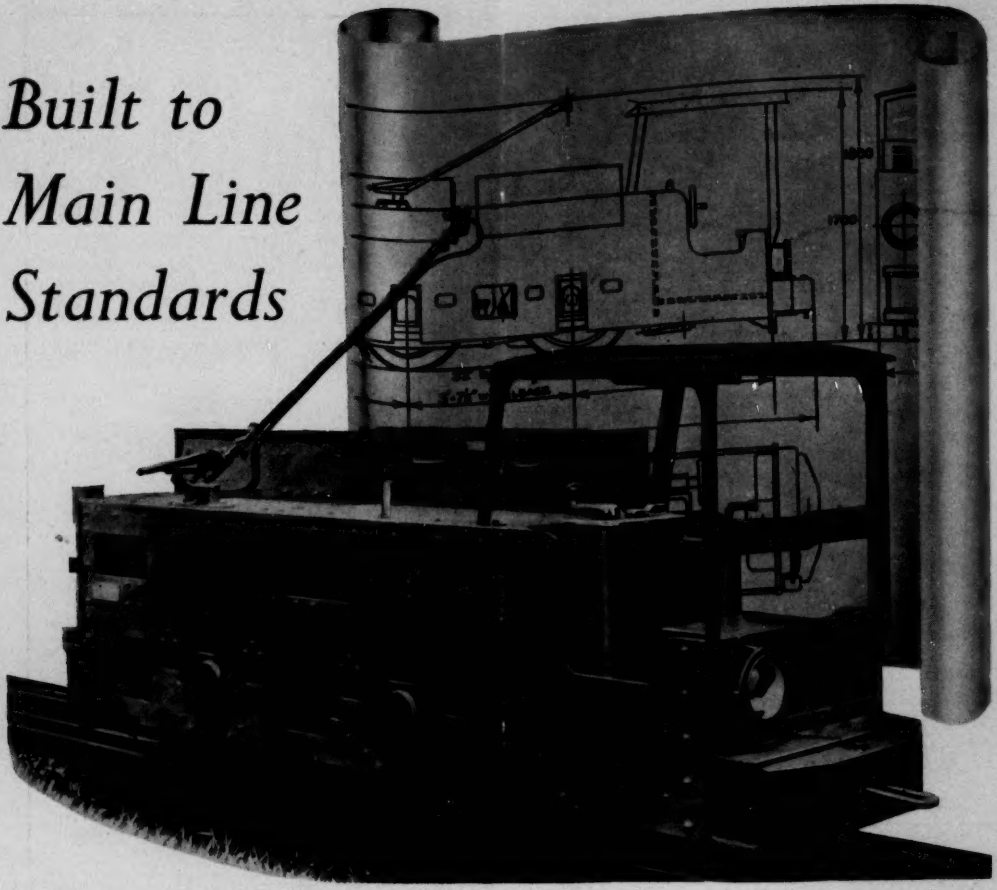

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